Sustaining and Broadening Intervention Impact: A Longitudinal Randomized Trial of 3 Adolescent Risk Reduction Approaches

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ABSTRACT. *Objective.* To determine whether the addition of a parental monitoring intervention (Informed Parents and Children Together [ImPACT]) alone or with "boosters" could enhance (either broaden or sustain or both) the effect of a small group, face-to-face adolescent risk reduction intervention Focus on Kids (FOK).

Methods. A longitudinal, randomized, community-based cohort study was conducted of 35 low-income, community-based, in-town settings. A total of 817 black youths aged 12 to 16 years at baseline were studied. After completion of baseline measures, youths were randomized to receive a face-to-face intervention alone (FOK only), a face-to-face intervention and a parental monitoring intervention (FOK plus ImPACT), or both of the above plus boosters (FOK plus ImPACT plus boosters). Risk and protective behaviors were assessed at 6 and 12 months after intervention.

Results. At 6 months' follow-up, youths in families that were assigned to FOK plus ImPACT reported significantly lower rates of sexual intercourse, sex without a condom, alcohol use, and cigarette use and marginally lower rates of "risky sexual behavior" compared with youths in families that were assigned to FOK only. At 12 months after intervention, rates of alcohol and marijuana use were significantly lower and cigarette use and overall risk intention were marginally lower among FOK plus ImPACT youths compared with FOK only youths. With regard to the boosters delivered at 7 and 10 months, 2 risk behaviors—use of crack/cocaine and drug selling—were significantly lower among the youths who were assigned to receive the additional boosters compared with youths without the boosters. The rates of the other risk behaviors and intentions did not differ significantly.

Conclusions. The results of this randomized, controlled trial indicate that the inclusion of a parental monitoring intervention affords additional protection from involvement in adolescent risk behaviors 6 and 12 months later compared with the provision of an intervention that targets adolescents only. At the same time, the results of the present study do not provide sufficient evidence that booster sessions further improve targeted behaviors enough to include them in a combined parent and youth intervention. *Pediatrics* 2003;111:e32–e38. URL: http://www.pediatrics.org/cgi/content/full/111/1/e32; *adolescents, parenting, HIV, risk behavior.*

ABBREVIATIONS. HIV, human immunodeficiency virus; FOK, Focus on Kids; ImPACT, Informed Parents and Children Together.

Several interventions have been demonstrated to be effective in reducing the prevalence of behaviors that place adolescents at risk for acquisition of human immunodeficiency virus (HIV).[1–6] These programs have in common a small-group and face-to-face method of delivery, an emphasis on skills development referent to decision making, communication, negotiation and condom use, use of a wide variety of instructional formats and approaches to intervention delivery, and grounding in social learning theory.[2–6] Despite the encouraging results that accompany these studies with reference to adolescent risk reduction, new challenges have emerged. First, the few studies that have followed participants beyond the immediate intervention period (6 months or less) have noted a decay of intervention effect on behavior over time,[5,6] prompting members of the National Institutes of Health Consensus Panel: Intervention to Prevent HIV Risk Behavior to identify sustainability of program effectiveness as 1 of the most important questions that professionals who are concerned with risk prevention face.[7] A challenge for behavioral change interventions in general, this issue is particularly vexing for interventions that target decreased involvement in sex and substance use with advancing age during adolescence.[8,9] Second, multiple behaviors (sex without a condom, sex with multiple partners, substance use before sex, etc) directly and indirectly place individuals at risk for acquisition of HIV. Although an abundance of literature supports the concept of a narrow intervention focus on specific risk behaviors, the nature of adolescent HIV/sexually transmitted disease risk reduction calls for a broader approach toward risk reduction.[9] In keeping with this approach, most HIV prevention programs that address risk behaviors in addition to these that directly place an individual at risk for transmission of infection have done so by relating them to these behaviors (ie, drug use increasing the likelihood of unsafe sexual practices[4]).

Options for extending and/or broadening the effects of a face-to-face intervention might include efforts to reinforce the initial intervention through the use of short booster sessions and/or efforts to influence the youths indirectly through changing perceptions of norms or expectations regarding behav-

iors.[8,10] Substantial research supports the role of both perceptions of peer values and norms and of parental monitoring and communication on adolescent perceptions, interventions, and behaviors.[11] In our own previous work, we have explored 2 of these options—boosters and parental monitoring—as means to extend and/or broaden the effects of a small-group, face-to-face HIV adolescent risk-reduction intervention.

The possible effects of a booster in addition to a "basic" program were explored in the original evaluation of Focus on Kids (FOK), 1 such small group, face-to-face HIV adolescent risk-reduction intervention. Delivered in 8 sessions over 2 months, FOK was evaluated in a randomized, longitudinal trial in which the study cohort was followed for 48 months after intervention.[12] A significant intervention impact was noted on rates of protected sexual intercourse 6 months after intervention, although by 12 months this effect was no longer apparent. However, a booster at 15 months was followed by a resurgence of intervention effect at 18 months on unprotected sex. Again, this effect was no longer apparent at 24 months and a repeat booster at 27 months was not associated with a resurgence of intervention effect at 36 months. Of note, although at 6 and 12 months there was no intervention effect on substance use, at 18 months drug use was lower among intervention compared with control youths.[13] In summary, this quasi-experimental (post hoc) study design provided some data suggesting that 1 or more boosters might result in a more sustained intervention impact and might result in broader intervention effect than is found from a more traditional, basic, face-to-face intervention.

In another set of studies, we explored the role of parental monitoring. A substantial research experience indicating the protective effect of parental monitoring and communication[8,14–16] prompted us to develop a parental monitoring intervention, Informed Parents and Children Together (ImPACT). ImPACT was evaluated through a randomized, controlled trial involving 237 parent-youth dyads who were followed for 12 months. An intervention effect on parental and youth concordance of perceptions of youth risk involvement was noted. By contrast, parents in the control dyads significantly underestimated youth protective and risk activities. In addition, at 6 months after intervention, intervention youths and parents (compared with control) demonstrated higher levels of condom-use skills,[17] which were measured by the Condom Use Skills Checklist[5] that operationalizes the steps involved in correct application and removal of a condom on a model. ImPACT alone did not reduce self-reported risk behaviors by adolescents.[18]

Accordingly, in the present 3-celled randomized, longitudinal study, we sought to determine whether the addition of a parental monitoring intervention alone or with boosters could enhance (either broaden or sustain or both) the effect of small-group, face-to-face adolescent risk reduction intervention.

METHODS

General

The 3-celled randomized, longitudinal trail was conducted among 817 youths located in and around 35 housing developments, community centers, and recreation centers in Baltimore, Maryland. Youths were recruited over 3 "waves." Wave 1 consisted of 8 sites, wave 2 consisted of 10 sites, and wave 3 consisted of 17 sites. Randomization occurred at the level of the site. After all youths within a wave completed baseline measures, parents and youths received ImPACT if randomized to FOK plus ImPACT or an attention control condition regarding employment readiness and education if randomized to FOK only.[17] Follow-up assessments were conducted at 6 and 12 months after intervention. Immediately after completing the 6-month assessment, youths who were randomized to the booster condition (FOK plus ImPACT plus booster) either received or were scheduled to receive the booster.

The study flow is shown in Fig 1. In summary, all youths (817) received FOK; approximately two thirds (496) of the youths with their parent(s) received ImPACT; and the others (321) received a parental attention control and, 6 months later, approximately one third of the youths (one half of those who received ImPACT) received a booster (as they did again at 10 months). Youths received a preintervention (baseline) assessment as well as ones at 6 and 12 months after intervention.

The research was approved by the Institutional Review Board at the University of Maryland. Written, informed consent/assent was obtained from parents and youths.

Interventions Components

Each of the 3 intervention components (FOK, ImPACT, and boosters) has been described in detail previously,[6,13,17] and therefore we only briefly summarize them here.

FOK is an HIV risk reduction intervention that consists of 8 sessions and emphasizes decision making, goal setting, communication, negotiating, and consensual relationships and information regarding abstinence and safe sex, drugs, alcohol, and drug selling. Intervention format includes games, discussions, homework assignments, and videos. The intervention is based on a social cognitive theory, protection motivation theory.[19] The intervention is delivered to a group of 5 to 10 youths by a group leader with an assistant group leader (both of whom are older than the youths in the intervention); gender and race of the group leaders were not necessarily the same as those of the youths.

ImPACT includes a 20-minute video (made in and for the targeted communities in Baltimore City) emphasizing several concepts of parental monitoring and communication (eg, "it is important to know where and with whom your child is," "talk with your children about sex") and is followed by 2 instructor-led role-play vignettes. The intervention is delivered in the youth's home by the interventionist, who first shows the video to the parent and youth on a portable video cassette player and then facilitates their role-playing of a preset vignette in which a parent is confronted with evidence of a child's involvement in a sexual relationship. After the role playing between the parent and the youth is completed, the interventionist critiques it according to the main talking points of the video and conducts a condom demonstration. The attention control consists of a 20-minute video describing the process for establishing and implementing career goals. The video is followed by a brief discussion with the interventionist following a written text.

Boosters for FOK were conducted immediately after the 6-month follow-up and at 10 months among the youths only. The booster sessions consist of a review of activities that had been done in the primary sessions and the addition of a few new activities that reviewed the content of the original program. Content includes information on decision making, sexual abuse, and sexual responsibility. Drug use and drug selling are also discussed, including a goal-setting game in which youths draw pictures of 3 goals and then are given "adjustments to the future" cards, one of which is being fired for testing positive for drugs and a second being arrested for selling drugs. Another game, "How Risky Is It?" includes items on drinking alcohol and using drugs to demonstrate how these activities impair decision making and affect risk for HIV.
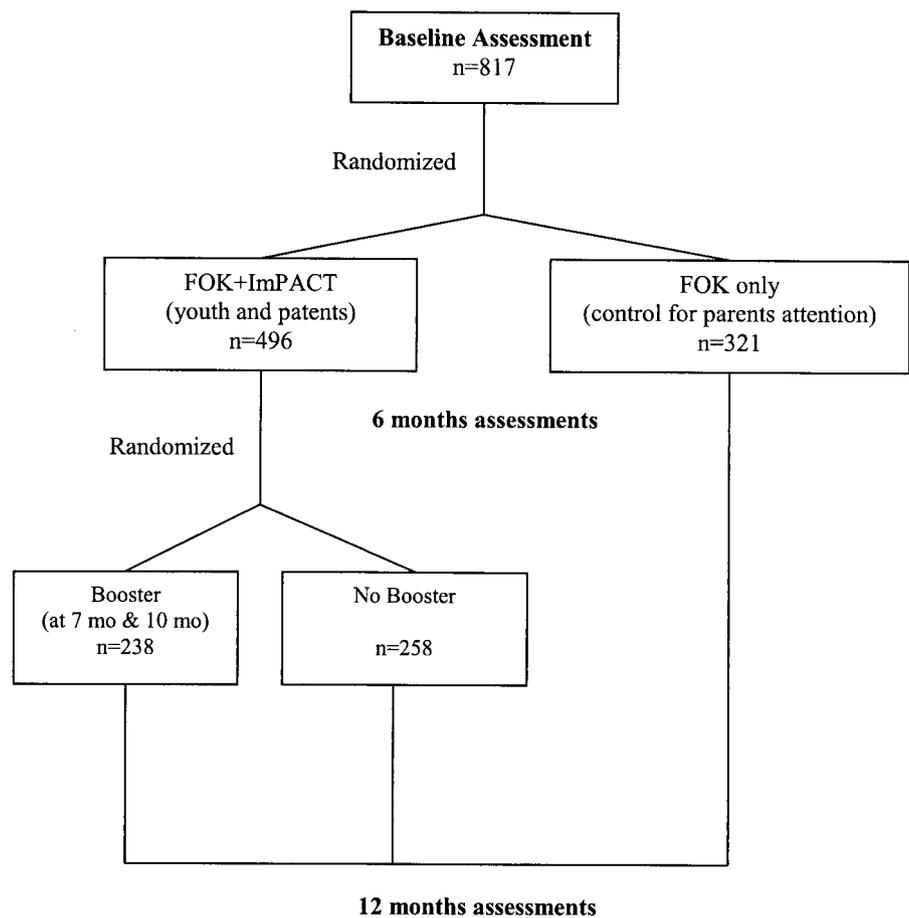
Fig 1. Study flow.

Participants

Eligible participants were youths who were aged 12 to 16 years and living in or around the 35 recruitment sites. Youths with a recognized psychiatric disorder or mental retardation were not eligible. Eligible youths were identified by a local facilitator, who described the program to the youths and parents and established an appointment time. Youths were eligible to enroll even if their parent or guardian was not willing to participate in ImPACT (or the control condition), although all parents of enlisted youths did participate.

Measures

Youth risk behaviors were assessed by youth self-report. The risk items investigated included sexual intercourse, condom use in the last sexual encounter (limited to youths who were sexually active), fighting, beating up someone, smoking cigarettes, consuming alcoholic beverages, using marijuana, selling drugs, and delivering drugs during the previous 6 months. Dichotomous responses (0 = No, 1 = Yes) were used for these items. A sexual risk variable was created by combining the sexual intercourse and condom use items (0 = no sex, 1 = had sex with condom, 2 = had sex without a condom) for measuring the degree of youth sexual risk.

Youths were also asked how likely they thought it was that in the next 6 months they would engage in a number of risk activities (smoking marijuana, selling drugs, delivering drugs, getting HIV infection, drinking alcohol, getting sexually transmitted disease, using cocaine, getting pregnant or getting a girl pregnant, sniffing glue, having sex, using a condom, or having a infant) along a 5-point response scale ranging from very unlikely to very likely. A scale score was calculated with higher scores indicating greater likelihood to engage in those risk behaviors in the near future. The Cronbach α values for the scale were 0.85, 0.93, and 0.91 at baseline, 6 months, and 12 months, respectively.

The Parental Monitoring Scale[20] with 6 items (eg, "My parent always know where I am after school") was used to assess youths' perceptions of parental monitoring. The scale reliabilities (Cron-

bach α) were 0.87, 0.93, and 0.94 at baseline, 6 months, and 12 months, respectively. The Parent Adolescent Communication Scale[21] was used to assess the effectiveness of family communication. The scale included 2 subscales: Open Communication Scale with 9 items asking questions such as, "I openly show affection to my parents," and Problem Communication Scale with 10 items asking questions such as, "Sometimes I have trouble believing everything my parent tells me." The Open Communication Scale has (Cronbach α) reliabilities of 0.87, 0.90, and 0.92 at baseline, 6 months, and 12 months, respectively. The Problem Communication Scale has reliabilities (Cronbach α) of 0.73, 0.79, and 0.82 at baseline, 6 months, and 12 months, respectively. Higher scores on the Open Communication Scale indicate higher levels of perceived effective communication in the family, and higher scores on the Problem Communication Scale indicates perceptions of more problems in family communication.

Administration of Questionnaires

The questionnaires were administered aurally and visually by a talking Macintosh computer.[22] (This methodology is described in greater detail elsewhere[22].) Questionnaires were administered in the respondents' homes and required approximately 45 minutes to administer.

Analysis

For comparing baseline equivalence among the different intervention groups, demographic characteristics between the FOK only group and the FOK plus ImPACT group were examined using χ^2 test. The group mean differences of youth risk behavior; intention to engage in targeted risk behaviors; and perceptions of parental monitoring, open communication, and problem communication were assessed by Student t test.

For assessing intervention effects on youth risk involvement and youth perceptions of parental monitoring and communications, the mean score differences between FOK only and FOK plus ImPACT were compared at 6 and 12 months after intervention. Because boosters were not implemented until the seventh month

after initiation, booster effect was assessed only at 12 months after intervention by comparing FOK plus ImPACT (only) with FOK plus ImPACT plus booster. For all of the items and scales analyzed, the baseline score was included in the model as the covariate to adjust for any initial differences between the groups. The general linear model procedure[23] in SAS software was used to conduct the analysis of covariance and obtain the least square means (ie, the means adjusted for baseline score). Because we were testing the hypothesis that the FOK plus ImPACT group mean score was less than FOK only (for risk behaviors and problem communication) or greater than the FOK only group (for protective factors), 1-tailed tests were used in follow-up (postintervention) analyses.

RESULTS

General

Overall, among the 817 participants enrolled in the study, 344 (42%) were male and all were black. The median age was 14 years. Approximately two thirds (64%) considered themselves to have a school performance above the middle, with an additional 32% reporting performance "in the middle." One third (33%) reported attending church at least once per week. Table 1 depicts these characteristics according to intervention status; none of these demographic characteristics differed significantly by intervention status.

Intervention Effect on Risk Behaviors and Intentions

Table 2 displays self-reported behaviors and intentions among the study youths to targeted risk and protective behaviors at baseline, 6 months after intervention, and 12 months after intervention. At baseline, none of these variables differed significantly by intervention status (eg, FOK only versus FOK plus ImPACT). By contrast, at 6 months' follow-up, after controlling for baseline differences, youths in families in which both the youth and the parents had received the interventions (FOK plus ImPACT) reported significantly lower rates of sexual intercourse, sex without a condom, and alcohol and cig-

arette use and marginally lower rates of risky sexual behavior (see definition of "risky sexual behavior" in Methods section) compared with youths in families in which only the youth had received the intervention (FOK only). At 12 months after intervention, again controlling for baseline differences, rates of alcohol and marijuana use were significantly lower and cigarette use and overall risk intention were marginally lower among FOK plus ImPACT youths compared with FOK only youths.

The final column in Table 2 depicts the effect of the boosters delivered at 7 months and 10 months among those 258 youths who received FOK plus ImPACT (only) compared with those who received FOK plus ImPACT plus boosters. Two risk behaviors—use of crack/cocaine and drug selling—were significantly lower among the youths who received the additional boosters compared with youths without the boosters. The rates of the other risk behaviors and intentions did not differ significantly.

Intervention Effect on Perceptions of Monitoring and Communication

Table 3 depicts youth perceptions of parental monitoring, open communication, and problem communication. At baseline, perceptions of parental monitoring were significantly higher among youths in families that were randomized to receive FOK plus ImPACT compared with youths whose families received FOK only. Although perceptions between both groups declined after baseline, perceptions of parental monitoring after controlling for baseline were significantly higher among youths who were exposed to FOK plus ImPACT compared with those who received FOK only at 6 months ($P = .008$). At 12 months, after controlling for baseline, when comparing perceptions of monitoring and communication between FOK plus ImPACT (only) and FOK plus ImPACT plus boosters, perceptions of parental mon-

TABLE 1. Demographic Characteristics at Baseline Among Youths Participating in a Randomized, 3-Celled Intervention Comparison

	Overall	FOK Only	FOK + ImPACT	P
N (%)	817	321 (39)	496 (61)	
Gender				.19
Male	344 (42)	145 (45)	200 (40)	
Female	471 (58)	176 (55)	295 (60)	
Age				.67
13	301 (37)	122 (39)	179 (37)	
14	184 (23)	65 (21)	119 (24)	
15	181 (23)	72 (23)	109 (22)	
16	135 (17)	55 (18)	80 (16)	
Grade				.17
Middle	362 (45)	143 (46)	219 (45)	
High	433 (54)	167 (53)	266 (55)	
Other	5 (1)	4 (1)	1 (0)	
School performance				.34
Above the middle	514 (64)	200 (65)	314 (65)	
In the middle	252 (32)	102 (33)	150 (31)	
Below the middle	30 (4)	8 (3)	22 (5)	
Church attending				.29
Never	117 (15)	48 (15)	69 (14)	
Rarely	279 (35)	112 (36)	167 (34)	
At least once a month	138 (17)	61 (19)	77 (16)	
At least once a week	266 (33)	93 (30)	173 (36)	

Significances of the differences were determined by χ^2 test.

TABLE 2. Intervention Group Mean Score Comparisons for Risk Behaviors and Intention Toward Risks at Baseline and at 6 Months and 12 Months After Interventions

	Baseline†			6 Months†*			12 Months†*			12 Months†* (FOK+ImPact)		
	FOK Only (n = 321)	FOK + ImPACT (n = 496)	P	FOK Only (n = 241)	FOK + ImPACT (n = 367)	P	FOK Only (n = 243)	FOK + ImPACT (n = 337)	P	FOK + ImPACT (n = 172)	FOK + ImPACT + Booster (n = 165)	P
Intervention target risks												
Sexual risk	0.54	0.50		0.50	0.43	.06	0.40	0.44		0.48	0.41	
Sexual intercourse	0.32	0.30		0.43	0.37	.05	0.35	0.36		0.39	0.33	
Unprotected sex	0.27	0.22		0.29	0.15	.005	0.26	0.28		0.30	0.26	
Smoked cigarette	0.14	0.13		0.20	0.15	.03	0.18	0.14	.07	0.13	0.14	
Drank alcohol	0.23	0.28		0.31	0.25	.04	0.31	0.22	.009	0.22	0.23	
Used marijuana	0.18	0.20		0.23	0.19		0.24	0.18	.04	0.20	0.16	
Used crack/cocaine	0.01	0.01		0.03	0.03		0.02	0.02		0.03	0.008	.05
Sold drug	0.06	0.04		0.06	0.07		0.04	0.05		0.06	0.03	.03
Delivered drug	0.04	0.02		0.04	0.05		0.05	0.05		0.05	0.03	
Other risk behaviors												
Carried a knife	0.11	0.14		0.09	0.12		0.08	0.09		0.07	0.10	
Fought	0.18	0.19		0.22	0.18		0.14	0.16		0.13	0.19	
Beat up someone	0.17	0.16		0.13	0.14		0.11	0.11		0.11	0.11	
Risk-taking intention	1.85	1.83		1.94	1.94		2.09	2.02	.09	2.01	2.03	.07

* Six-month and 12-month group's means and P values were adjusted for baseline scores. All $P < .1$ were listed.
† Except sexual risk, 2 response levels (0,1) were used to calculate the group means for risk items. Mean × 100 = prevalence rates.

TABLE 3. Intervention Group Mean Score Comparisons for Parental Monitoring and Communication at Baseline and 6 Months and 12 Months After Interventions

Scales†	Baseline			6 Months*			12 Months*			12 Months* (FOK + ImPact)		
	FOK Only (n = 321)	FOK + ImPACT (n = 496)	P	FOK Only (n = 241)	FOK + ImPACT (n = 367)	P	FOK Only (n = 243)	FOK + ImPACT (n = 337)	P	FOK + ImPACT (n = 172)	FOK + ImPACT + Booster (n = 165)	P
Monitoring	3.92	4.18	.0003	3.67	3.88	.008	3.67	3.73		3.69	3.77	
Open communication	3.87	3.83		3.55	3.61		3.44	3.53		3.47	3.59	
Problem communication	2.78	2.84		3.08	3.09		2.97	3.08	.04	3.16	2.99	.02

* Six-month and 12-month group's means and P values were adjusted for baseline scores. All $P < .1$ were listed.
† Higher score suggests higher monitoring level, higher open communication skill, and more problems in communication.

itoring and open communication did not differ by intervention status. Perceptions of problem communication were significantly lower among those who received the boosters ($P = .02$).

DISCUSSION

General

The results of this randomized, longitudinal trial indicate that the inclusion of a parental monitoring intervention affords additional protection from involvement in adolescent risk behaviors 6 and 12 months later compared with the provision of an intervention that targets adolescents only. To the best of our knowledge, these results are the first to demonstrate the added benefit of parental monitoring intervention in addition to a youth risk reduction intervention. This benefit is apparent in the short term for sexual risk and substance abuse and over the long term for substance abuse. At the same time, the results of the present study do not provide sufficient evidence that booster sessions further improve targeted behaviors to argue for their inclusion in a combined parent and youth intervention.

For ethical reasons, we did not include a control group in this study and therefore cannot comment with certainty on the impact of FOK only (which had been shown to be effective in this population several years earlier[6]). However, despite the developmentally expected increase in sexual and drug-related risk behaviors with advancing age,[24] participation in these behaviors remained essentially constant over the course of the year as shown in Table 2. Likewise, we did not address the question of whether boosters without a parental monitoring intervention enhance the duration or scope of a basic, face-to-face adolescent risk reduction intervention and so cannot comment on their possible utility in this setting.

Potential Limitations of the Study

These results represent youth self-reports of behaviors and perceptions of parental monitoring and communication and were not validated by external methods. However, previous work and their comparability to other reports[13] and the comparability with other reports[24] suggest that youth self-reports of behavior are credible. Our previous research also found that there is a high degree of concordance between youth reports of parental monitoring and communication with those of parents and with youth risk involvement.[17] Although the study participants represent a convenience sample rather than systematic sampling, the allocation to study condition was done randomly. Although 13% of youths were absent for follow-up at both 6 months and 12 months (26% at 6 months, 29% at 12 months), the demographic and risk profile of these youths at baseline did not differ significantly from those available at 1 or both follow-ups (data are available on request from the authors). Attrition was comparable by intervention condition at 6 months (data were available at 6 months for 75% of FOK only participants and 74% of FOK plus ImPACT participants, $P = .8$). At 12 months, data were available from 76% for FOK

only participants, 67% for FOK plus ImPACT participants, and 69% for FOK plus ImPACT plus boosters participants ($P = .05$).

Implications

These data are important because they suggest a new intervention direction for strengthening and broadening risk reduction intervention impact. This issue is important throughout the life cycle but especially for adolescents whose cognitive abilities and perceived social norms are changing rapidly,[25,26] thus creating a fluid and uneven environment for the delivery of behavioral interventions. This intervention also allows for the continued but appropriate involvement of the parent in the adolescent's life and enables the parent to feel comfortable discussing topics that traditionally they have found vexing.

At the same time, the results suggest that the format and/or content of the parental interventions may need to be altered. Although intervention impact was sustained through 12 months, the effect was not as pronounced on sexual risk behavior. Although it is possible that events such as condom use may be less amenable to parental interventions,[8,27] it is equally possible that the timing or delivery of the message to the parents could be altered. In addition, material regarding actual parent-adolescent communication might fortify this intervention effect. Likewise, broadening the targeted adults to include not only parents (in this case, usually the mother) but also 1 or 2 other significant adults might be important given that youths rarely seek a single adult for all of their communication.[28,29]

Future Studies

Consistent with this line of reasoning, future studies regarding adolescent HIV risk reduction interventions should include a parental component but one that is more developmentally specific (eg, targets parenting skills at different ages) and that includes more examples and practice relevant to parent-adolescent communication about sexual intercourse and condom use.

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